

# MATERIAL SAFETY DATA SHEET

---

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

---

National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2300  
Gaithersburg, Maryland 20899-2300

SRM Number: 1077a  
MSDS Number: 1077a  
SRM Name: Silver 2-Ethylhexanoate

Date of Issue: 12 September 2006

MSDS Coordinator: Mario J. Cellarosi  
Telephone: 301-975-6776  
FAX: 301-926-4751  
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:  
1-800-424-9300 (North America)  
+1-703-527-3887 (International)

**Description:** This Standard Reference Material (SRM) is intended for use in the preparation of a standard of silver in lubricating oils. It is essentially free from other metals. Each unit consists of 5 g of silver 2-ethylhexanoate.

**Substance:** Silver 2-Ethylhexanoate

**Other Designations:** Silver 4-cyclohexylbutyrate; silver cyclohexanebutyrate; cyclohexanebutanoic acid, silver (1+) salt.

---

## 2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

---

<b>Component:</b>	Silver 2-Ethylhexanoate
<b>CAS Number:</b>	62638-04-4
<b>EC Number (EINECS):</b>	263-667-9
<b>Nominal Mass Fraction (%):</b>	100
<b>EC Classification:</b>	Xi (Irritant); not classified in Annex I of Directive 67/548/EEC
<b>EC Risk:</b>	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
<b>EC Safety:</b>	S23 (do not breathe fumes) S24/25 (avoid contact with skin and eyes) S45 (in case of accident or illness, see doctor; show label)

---

## 3. HAZARDS IDENTIFICATION

---

**NFPA Ratings (Scale 0-4):** Health = 1      Fire = 0      Reactivity = 0

**Major Health Hazards:** Silver compounds are irritating by inhalation, contact, or ingestion. Chronic exposure may also cause permanent discoloration of the skin and eyes.

**Physical Hazards:** None documented for this material. Dust-air mixture may explode at high temperature. Container may break.

### Potential Health Effects

**Inhalation:** Inhalation of silver compounds may cause severe irritation of the mucous membranes and respiratory tract.

**Skin Contact:** Contact with this material may cause skin irritation. Chronic exposure to silver may cause argyria (permanent blue-gray discoloration of skin or other tissues). Silver may be absorbed through broken skin. Allergic sensitization to silver or other metals may occur.

**Eye Contact:** This material may cause severe eye irritation. Chronic exposure to silver compounds may also cause permanent blue-gray discoloration of the eyes or decreased night vision.

**Ingestion:** The toxicity of this material has not been fully investigated. Ingestion of this material may irritate the GI tract, causing abdominal pain, nausea, vomiting, and diarrhea. Chronic ingestion of silver may cause argyria (permanent blue-gray discoloration of skin or other tissues).

**Medical Conditions Aggravated by Exposure:** As an irritant, this compound may aggravate disorders affecting the respiratory tract, skin, eyes, GI tract, or other target organs.

**Listed as a Carcinogen/ Potential Carcinogen:**

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<u>      </u>	<u>  X  </u>
In the International Agency for Research on Cancer (IARC) Monographs	<u>      </u>	<u>  X  </u>
By the Occupational Safety and Health Administration (OSHA)	<u>      </u>	<u>  X  </u>

---

## 4. FIRST AID MEASURES

---

**Inhalation:** Move the person to fresh air immediately. If not breathing, qualified medical personnel may start CPR or give oxygen if necessary. Get medical aid at once, and bring the container or label.

**Skin Contact:** Remove contaminated clothing and shoes. Flush affected skin with water for at least 15 minutes, then wash thoroughly with soap and water. If skin irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

**Eye Contact:** Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 30 minutes, keeping eyelids open and raising lids to remove all chemical. Get medical aid at once, and bring the container or label.

**Ingestion:** Contact a poison control center immediately for instructions. Wash out mouth with water, but do not induce vomiting. Get medical aid at once, and bring the container or label.

---

## 5. FIRE FIGHTING MEASURES

---

**Fire and Explosion Hazards:** This material is not believed to be a significant fire hazard under normal conditions. Dust-air mixtures may explode if an ignition source is present. Products of thermal decomposition may be toxic.

**Extinguishing Media:** Use extinguishing media appropriate to the surrounding fire, such as water spray, carbon dioxide, dry chemical, or foam. Cool containers from maximum distance using water spray.

**Fire Fighting:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** N/A

**Autoignition (°C):** N/A

**Lower Explosive Limit (LEL):** N/A

**Upper Explosive Limit (UEL):** N/A

**Flammability Class (OSHA):** N/A

**Products of Combustion:** Thermal decomposition of this material may produce carbon oxides (CO, CO<sub>2</sub>) and silver oxides.

---

## 6. ACCIDENTAL RELEASE MEASURES

---

**Occupational Release:** Isolate the spill area and remove any sources of ignition. Cleanup personnel must wear personal protective equipment ("Section 8"). Sweep up material and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Provide ventilation.

**Disposal:** Refer to Section 13, "Disposal Considerations".

---

## 7. HANDLING AND STORAGE

---

**Storage:** Store this material in the original container at room temperature. Protect from moisture, heat, and physical damage, and isolate from incompatible materials. Do not expose this material to light.

**Safe Handling Precautions:** Wear a dust mask or respirator. Avoid contact or wash after handling.

---

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

---

### Exposure Limits (Silver Dust and Soluble Compounds):

ACGIH TLV-TWA: 0.01 mg/m<sup>3</sup>

OSHA TLV-TWA: 0.01 mg/m<sup>3</sup>

UK WEL: 0.01 mg/m<sup>3</sup>

**Ventilation:** Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

**Respirator:** If necessary, refer to the NIOSH document *Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

**Eye Protection:** Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

**Personal Protection:** Wear appropriate gloves and protective clothing to prevent contact with skin.

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

---

**Component:** Silver 2-Ethylhexanoate

**Appearance and Odor:** White powder

**Relative Molecular Weight:** 277.1

**Molecular Formula:** C<sub>10</sub>H<sub>17</sub>AgO<sub>2</sub>

**Density (g/cm<sup>3</sup>):** N/A

**Solvent Solubility:** N/A

**Water Solubility:** N/A

**Boiling Point (°C):** N/A (decomposes)

**Melting Point (°C):** 254 (489 °F)

**Solubility:** N/A

---

## 10. STABILITY AND REACTIVITY

---

**Stability:**    ☒ Stable                    ☐ Unstable

Stable at normal temperature and pressure.

**Conditions to Avoid:** Heat or flame; dust generation; incompatible materials; exposure to light.

**Incompatible Materials:** Strong oxidizers, acetylene, ammonia.

**Fire/Explosion Information:** See "Section 5".

**Hazardous Decomposition:** Thermal decomposition of this material may produce carbon oxides (CO, CO<sub>2</sub>) and silver oxides.

**Hazardous Polymerization:**       ☐ Will Occur       ☒ Will Not Occur

---

## 11. TOXICOLOGICAL INFORMATION

---

**Route of Entry:**       ☒ Inhalation                    ☒ Skin                    ☒ Ingestion

**Toxicity Data (Silver):**

Rat, oral, LD<sub>50</sub>: > 2000 mg/kg

Rabbit, skin: Slightly irritating

**Target Organ(s):** Respiratory tract, skin, eyes, GI tract.

**Mutagen/Teratogen:** The toxicity of this compound has not been fully investigated. Silver is not known to cause mutations or birth defects. However, 2-ethylhexanoic acid (CAS 149-57-5) may cause birth defects.

**Health Effects:** See "Section 3".

---

## 12. ECOLOGICAL INFORMATION

---

**Ecotoxicity Data (Silver):**

Eastern narrow-mouthed toad (*Gastrophryne carolinensis*), LC<sub>50</sub> (7 days): 10.0 µg/L

Bluegill (*Lepomis macrochirus*), LC<sub>50</sub> (96 hrs): 64.0 µg/L

Rainbow trout (*Oncorhynchus mykiss*), LC<sub>50</sub> (96 hrs): 13.0 µg/L

**Ecotoxicity (Ethylhexanoate):**

Fathead minnow (*Pimephales promelas*), LC<sub>50</sub> (96 hrs): 8,940 µg/L

**Environmental Summary:** Although no ecotoxicity data are available for silver 2-ethylhexanoate, elemental silver and its compounds are toxic to many aquatic organisms. Do not release to the environment.

---

## 13. DISPOSAL CONSIDERATIONS

---

**Waste Disposal:** Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location.

---

## 14. TRANSPORTATION INFORMATION

---

**U.S. DOT and IATA:** Not regulated.

---

## 15. REGULATORY INFORMATION

---

### U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Regulated as Silver Compounds (N740), no RQ

SARA Title III Section 302: Not regulated

SARA Title III Section 304: Not regulated

SARA Title III Section 313: Regulated

OSHA Process Safety (29 CFR 1910.119): Not regulated

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes
CHRONIC:	Yes
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

### STATE REGULATIONS

California Proposition 65: Not regulated.

### CANADIAN REGULATIONS

WHMIS Classification: Not regulated.

### EUROPEAN REGULATIONS

EU/EC Classification: Xi (Irritant); not classified in Annex I of Directive 67/548/EEC.

### NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed.

TSCA 12(b), Export Notification: Not listed.

---

## 16. OTHER INFORMATION

---

### Sources:

IUCLID Chemical Data Sheet: Silver. European Chemicals Bureau, 19 February 2000.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, September 2005 edition. DHHS (NIOSH) Publication No. 2005-151.

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.